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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/801,930	03/16/2004	Severine Catreux	16136US02	4709
7590 Christopher C. Winslade McAndrews, Held & Malloy Suite 3400 500 W. Madison Street Chicago, IL 60661		06/14/2007	EXAMINER FILE, ERIN M	
			ART UNIT 2611	PAPER NUMBER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

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<b>Office Action Summary</b>	Application No. 10/801,930	Applicant(s) CATREUX ET AL.	
	Examiner Erin M. File	Art Unit 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 June 2007.  
 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.  
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-44 is/are pending in the application.  
     4a) Of the above claim(s) 1-6, 14-18, 25-32, 40, 43 and 44 is/are withdrawn from consideration.  
 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
 6) ☐ Claim(s) 7-13, 19-24, 33-39, 41, 42, 44 is/are rejected.  
 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
 10) ☒ The drawing(s) filed on 3/16/2004 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☐ All    b) ☐ Some \*    c) ☐ None of:  
         1. ☐ Certified copies of the priority documents have been received.  
         2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
         3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>3/14/2005</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Drawings*

1. The drawings are objected to under 37 CFR 1.83(b) because they are incomplete. 37 CFR 1.83(b) reads as follows:

When the invention consists of an improvement on an old machine the drawing must when possible exhibit, in one or more views, the improved portion itself, disconnected from the old structure, and also in another view, so much only of the old structure as will suffice to show the connection of the invention therewith.

2. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance. The

drawings are incomplete because they fail to illustrate a method as described in claims 7-13.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 7, 8, 13, 19, 20, 33-35, 38, and 39 are rejected under 35 U.S.C. 102(b) as being anticipated by Raleigh et al. (U.S. Patent No. 5,809,422).

**Claims 7, 19, 33, 37, Raleigh discloses:**

- demultiplexing an input signal into a first plurality of demultiplexed signals (fig. 2, 104);
- upconverting said first plurality of demultiplexed signals into a first plurality of upconverted signals (col. 7, line 65 – col. 8, line 2);
- dividing said first plurality of upconverted signals into a second plurality of divided signals (fig. 2, 114 divides the signal);
- weighting said second plurality of divided signals so as to form a second plurality of weighted signals (fig. 2, 118, col. 11, lines 14-15 disclose beamformer 118 weights and combines the divided signals);
- combining ones of said second plurality of weighted signals in order to form a third plurality of combined signals (fig. 2, 118, col. 11, lines 14-15 disclose beamformer 118 weights and combines the divided signals);

- and transmitting said third plurality of combined signals (col. 7, line 65 – col. 8, line 2).

**Claims 8, 20**, Raleigh further discloses a third plurality of combined signals are transmitted via a corresponding third plurality of antennas (col. 16. lines 44-45).

**Claims 13**, Raleigh further discloses each of said first plurality of upconverted signals is divided into a set of signal components equal in number to said third plurality of combined signals (see fig. 2, number of modulated signals is equal to number of combined signals).

**Claim 34, 38**, Raleigh further discloses an arrangement of dividing elements capable of dividing said first plurality of RF signals into a third plurality of divided RF signals (fig. 2, 114 divides the signal).

**Claim 35**, Raleigh further discloses weighting elements capable of weighting said third plurality of divided RF signals so as to form a third plurality of weighted RF signals; a combiner arrangement for combining ones of said third plurality of weighted RF signals in order to form said second plurality of RF signals (fig. 2, 118, col. 11, lines 14-15 disclose beamformer 118 weights and combines the divided signals).

**Claim 39**, Raleigh further discloses an arrangement of weighting elements capable of weighting said first plurality of divided RF signals so as to form said first plurality of RF signals (fig. 2, 118, col. 11, lines 14-15 disclose beamformer 118 weights and combines the divided signals).

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5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 9-11, 21-23, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raleigh et al. (U.S. Patent No. 5,809,422) as applied to claims 7, 19, and 33 above, and further in view of Foschini et al. (U.S. Patent No. 6,888,809).

**Claims 9, 21,** Raleigh fails to disclose converting a plurality of demultiplexed signals into analog signals, however, Foschini discloses a plurality of demultiplexed signals into analog signals (fig. 2, elements 115 are digital to analog converters prior to upconverters 117). Because Foschini discloses this transmission method has the advantage of improving the ability of the receiver to extract the transmitted signals from the received signal (col. 1, lines 31-34) it would have been obvious to one skilled in the art at the time of invention to incorporate the transmission method as disclosed by Foschini into the invention as disclosed by Raleigh.

**Claims 10, 22, 36,** Raleigh fails to disclose weighting and combining, in the baseband domain, said first plurality of demultiplexed signals prior to said upconverting, however, - Foschini discloses weighting and combining, in the baseband domain, said first plurality of demultiplexed signals prior to said upconverting (see fig. 1, signals are output from the demux 101 weighted by element 109 and combined at element 111 prior to upconversion at element 117).

**Claims 11, 23,** Raleigh fails to disclose weighting and combining, in the baseband

domain, said first plurality of demultiplexed signals prior to said upconverting, however, - Foschini discloses weighting and combining, in the baseband domain, said first plurality of demultiplexed signals prior to said upconverting (see fig. 1, signals are output from the demux 101 weighted by element 109 and combined at element 111 prior to upconversion at element 117).

7. Claims 12 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raleigh et al. (U.S. Patent No. 5,809,422) as applied to claims 8 and 20 above, and further in view of Ling et al. (U.S. Pub. No. 2004/0165558).

**Claims 12, 24**, Raleigh fails to disclose a plurality of demultiplexed signals are less in number than said third plurality of antennas, however, Ling discloses a plurality of demultiplexed signals are less in number than said third plurality of antennas (see fig. 2A, which shows fewer demultiplexers than transmit antenna). Because Ling discloses this has the advantage of providing improved performance for a wireless communication system ([0003]), it would have been obvious to one skilled in the art at the time of invention to incorporate the multiplexing as disclosed by Ling into the invention of Raleigh.

8. Claims 41, 42, and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raleigh et al. (U.S. Patent No. 5,809,422) as applied to claims 14, 19, and 35 above, and further in view of Iwamatsu et al. (U.S. Pub. No. 2003/0045313).

**Claims 41, 42, 44**, Raleigh fails to disclose selecting weighting values are selected to

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maximize an output signal-to-noise ratio of a receiver disposed to receive said second plurality of RF signals, however, Iwamatsu discloses selecting weighting values are selected to maximize an output signal-to-noise ratio of a receiver disposed to receive said second plurality of RF signals ([0010]). Because Iwamatsu discloses this method of weighting and combining has advantages over the prior art of increased accuracy in highly correlated environments ([0006]), it would have been obvious to one skilled in the art at the time of invention to incorporate the weighting and combining as disclosed by Iwamatsu into the invention of Ralieg.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erin M. File whose telephone number is 5712726040. The examiner can normally be reached on M-F 1-9:30PM.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Payne can be reached on 5712723024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Erin M. File/  
Assistant Examiner, AU 2611  
6/7/2006

  
DAVID C. PAYNE  
SUPERVISORY PATENT EXAMINER